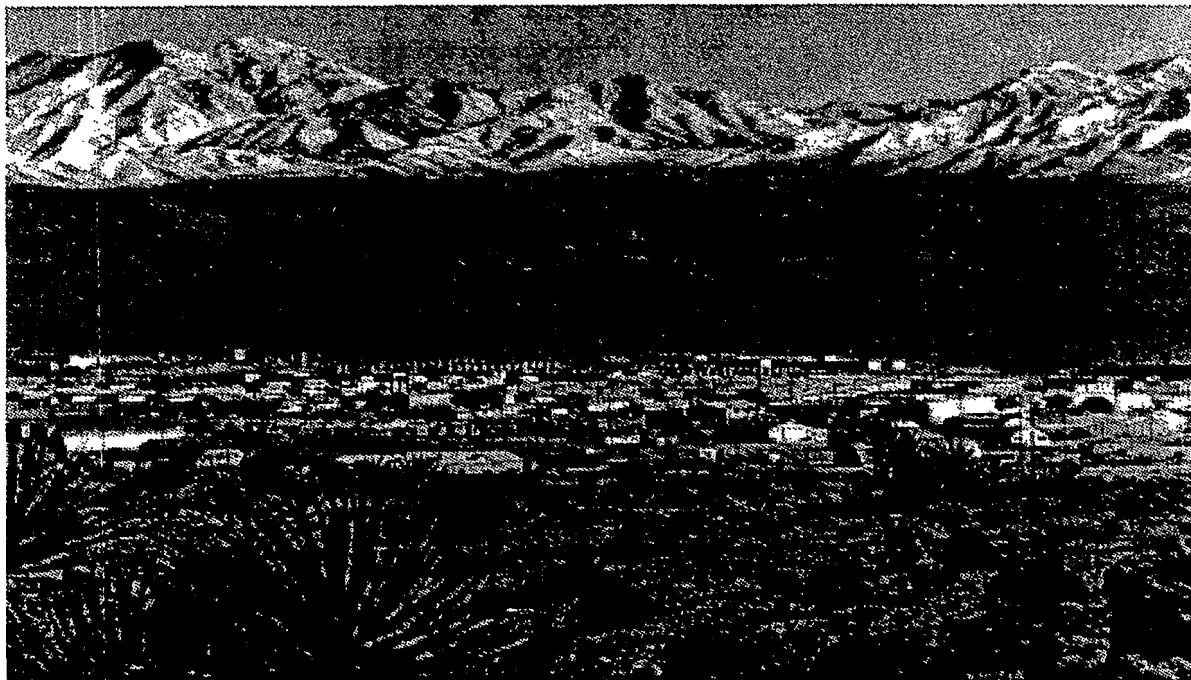




Field Research Facility Under Construction at the Nevada Test Site

*View looking north
at the town of
Mercury on the
Nevada Test Site.*

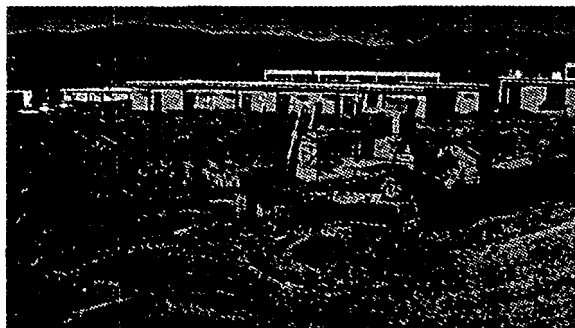


The U.S. Environmental Protection Agency (EPA), National Exposure Research Laboratory (NERL) is in the process of constructing a Field Research Facility (FRF) at the U.S. Department of Energy (DOE) Nevada Test Site (NTS). Final completion of the facility is anticipated in October, 2000. The NTS has been declared an Environmental Research Park, and other research on environmental topics, such as global warming and the containment and cleanup of gaseous spills, are ongoing at the site. The FRF will be located in Mercury, Nevada; a government operated town on the NTS 75 miles northwest of Las Vegas.

This facility will be operated by the NERL's Environmental Sciences Division, Characterization and Monitoring Branch (CMB). This controlled spill field research facility will be a unique research and development site for experiments related to innovative technology demonstration, ground water and vadose zone monitoring, soil sampling, chemical leak and spill detection, and geophysical site characterization.

It is anticipated that multiple experiments will be conducted in this facility, ranging from geophysical experiments, ground-water sampler testing, soil sampler testing and evaluation, to remediation monitoring experiments. The FRF will be filled with selected types of porous media (e.g., soil, silt, sand, gravel) or with engineered materials (slurry walls or filter walls) depending on the type of experiment to be conducted. Most of these experiments will be performed sequentially during one controlled spill event.

*Excavation of the
FRF in Mercury.
The dorm building
in background will
be used as office
and storage space.*



The facility will consist of a non-metallic reinforced concrete tank, underlain by a leak containment system consisting of geomembrane liners. The tank will have interior dimensions of 9 by 12 meters, and will be 3 meters deep. The tank will have a unique nonmetallic reinforcing rod system that will allow geophysical experiments using electromagnetic tools and ground penetrating radar to be undertaken with no outside interference from the tank's construction. There are no other research facilities that have this capability. Porous media of known physical parameters will be placed in the tank so experiments can be undertaken without the additional problems of unknown site characterization that occur at sites in natural materials.

In addition to the tank, a mobile laboratory already acquired by CMB will be deployed at the site. The mobile lab unit will provide analytical facilities for both laboratory grade and field portable instruments. An existing dormitory complex at the site will also provide office and storage space for the FRF based research projects.

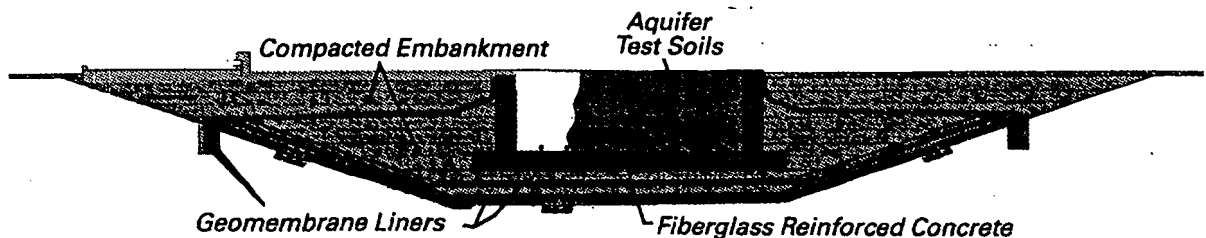
Upon completion of the initial spill experiments, research is proposed to examine remediation and containment technologies. In conjunction with other EPA scientists at Athens, Georgia, and Ada, Oklahoma, research could be conducted into soil and ground water remediation. Remediation techniques researched could include: bioremediation, air sparging, the use of oxidizers, and pump and treat. The

effectiveness and rate of these techniques can be accurately monitored in the FRF. In addition, design and monitoring of types of containment technologies, such as slurry walls and sheet pilings, could be studied.

Future possible experiments include: sampling device comparisons for ground water samplers, soil samplers, and vadose zone pore liquid samplers for organic and inorganic contaminants. In these studies, traditional samplers as well as new in-situ devices will be tested. Tests of factors relating to the design of monitoring wells can also be conducted including grout design, filter pack design, and screen designs. A peer-reviewed research plan has been completed by CMB for the first several experiments to take place in the FRF. These experiments will involve the spilling of a DNAPL, perchloroethylene (PCE), into the tank and conducting geophysical, ground water, and soil monitoring of the movement and distribution of the PCE.

Geologic exploration of the foundation of the facility and rough excavation of the site occurred in January of 2000. It is anticipated the placement of the geomembrane liners and the concrete will begin in May or June of 2000, with final completion in October. The facility was designed by the U.S. Bureau of Reclamation's Technical Service Center in Denver, Colorado. The facility is being constructed under the DOE's contract with Bechtel Nevada Corporation at the NTS.

Cross section of FRF showing geomembrane liners and the concrete test cell.



For Further Information

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